

# NASA DEVELOP:

A Program Introduction

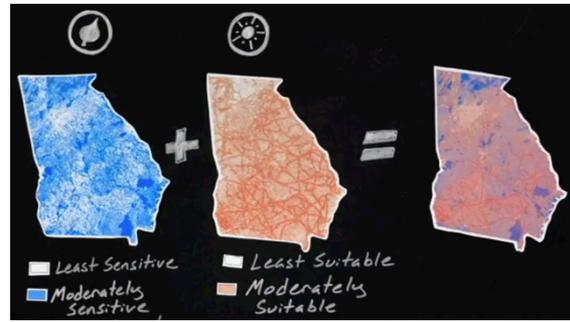
Jenna Williams  
Center Lead

John Dilger  
Geoinformatics Fellow



# What is DEVELOP?

NASA Earth Observations  
Feasibility Studies  
Early Career Professionals  
10-week Projects  
Enhances Decision Making





# NASA Applied Sciences

Discovering Innovative & Practical Applications of NASA Earth Science

**Transportation & Infrastructure**



**Disasters**



**Urban Development**



**Water Resources**



**Ecological Forecasting**



**Agriculture & Food Security**



**Energy**



**Health & Air Quality**





# Capacity Building

Applied Sciences' Capacity Building Program increases awareness within non-traditional audiences



ARSET



DEVELOP



SERVIR

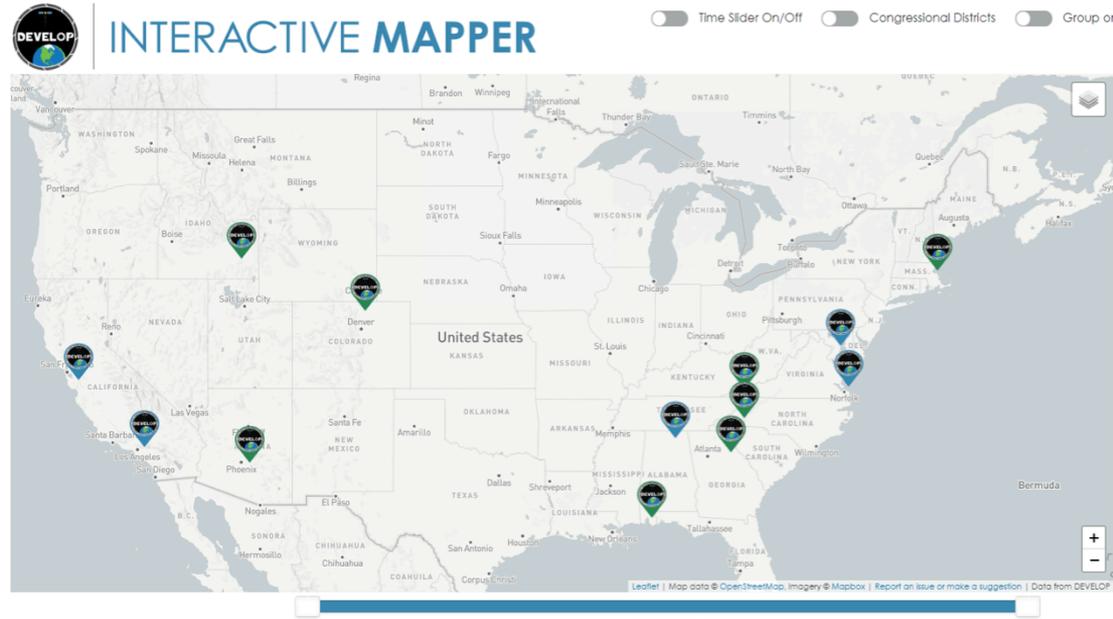
## NASA Centers

1. Ames Research Center – Moffett Field, CA
2. Goddard Space Flight Center – Greenbelt, MD
3. Jet Propulsion Laboratory – Pasadena, CA
4. Langley Research Center – Hampton, VA
5. Marshall Space Flight Center – Huntsville, AL

## Regional Locations

6. BLM at Idaho State University – Pocatello, ID
7. Maricopa County Department of Public Health and Arizona State University – Tempe, AZ
8. Mobile County Health Department – Mobile, AL
9. NOAA National Centers for Environmental Information – Asheville, NC
10. University of Georgia – Athens, GA
11. USGS at Colorado State University – Fort Collins, CO
12. Wise County Clerk of Court's Office – Wise, VA
13. Boston University – Boston, MA

# DEVELOP Node Locations



**13 Locations**  
**10 week projects**  
**3 Terms/year**



# DEVELOP GitHub



The screenshot shows the GitHub organization page for NASA-DEVELOP. At the top, there is a navigation bar with 'This organization', a search bar, and links for 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. The organization's profile includes the NASA logo, the name 'NASA-DEVELOP', and the location 'NASA Langley Research Center'. Below the profile, there are statistics for 'Repositories 29', 'People 5', and 'Projects 0'. A search bar for repositories is present, along with filters for 'Type: All' and 'Language: All'. The main content area features two repository entries: 'PrIME' and 'CCROP'. The 'PrIME' entry includes a description about precipitation and rainwater harvesting, updated 2 hours ago. The 'CCROP' entry describes a project involving satellite imagery and JavaScript scripting. To the right of the repository list, there are two sidebars: 'Top languages' showing Python, JavaScript, R, and Matlab; and 'People' showing 5 members with profile pictures.

End Goal

Process

Examples



# Lassen Volcanic NP Disasters

AMES Research Center  
Summer and Fall 2017



## Project Partner

- Lassen Volcanic NP

## Project Collaborator

- U.S. Forest Service

## Community Concerns

- Fuel Loading
- Wilderness Stewardship
- Fire Risk Management



# End Products

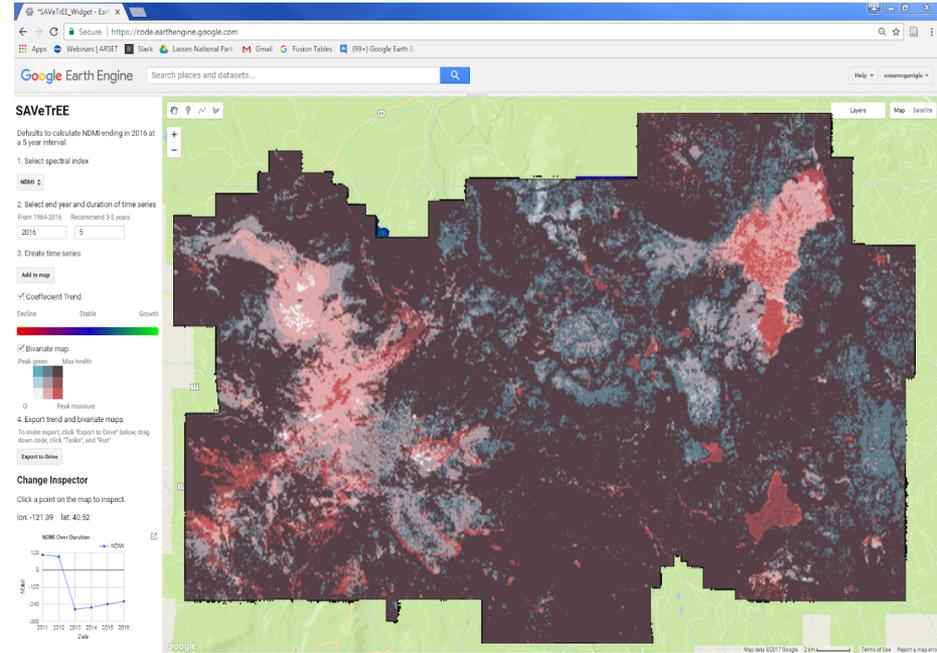
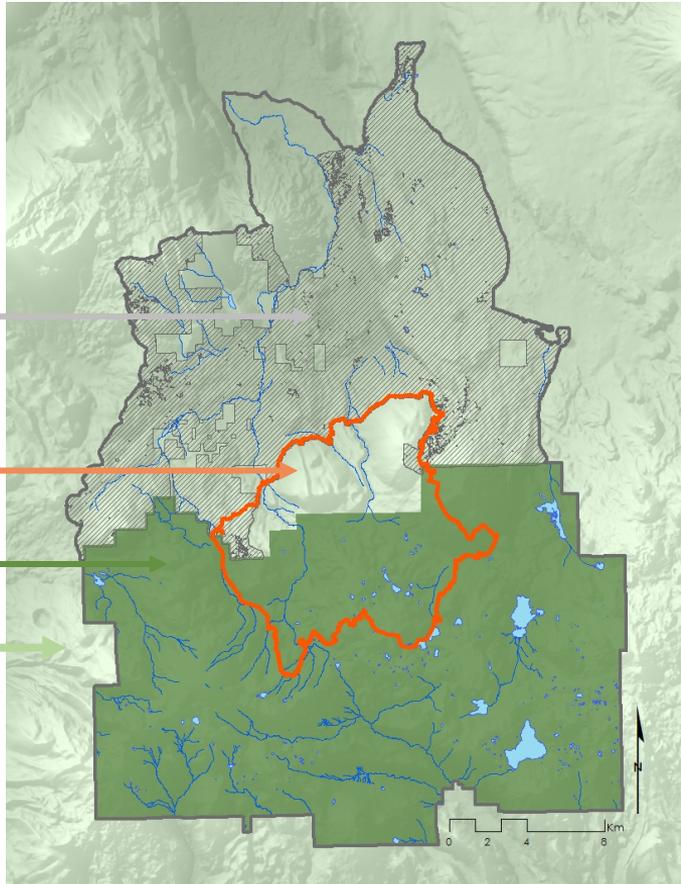
## LIDAR Analysis

Badger Planning Area

Reading Fire

LVNP

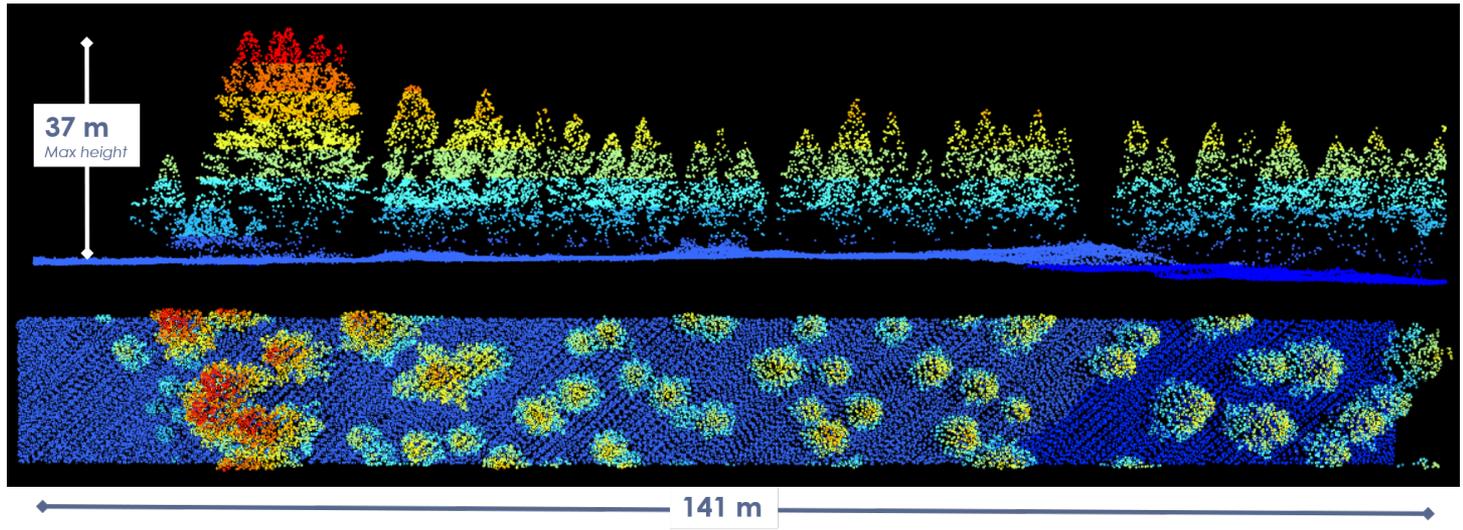
LNF



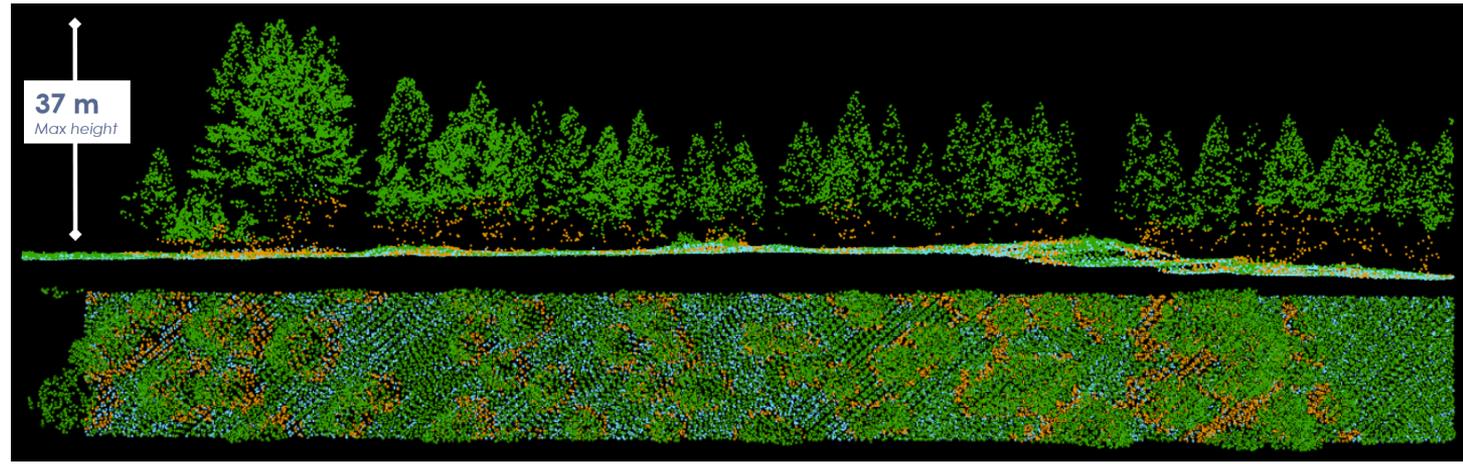
## Simple Analysis of Vegetation Trends in Earth Engine (SAVETREE)



# Canopy Height Model

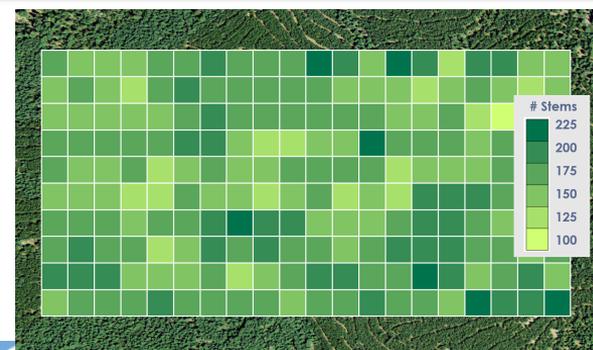
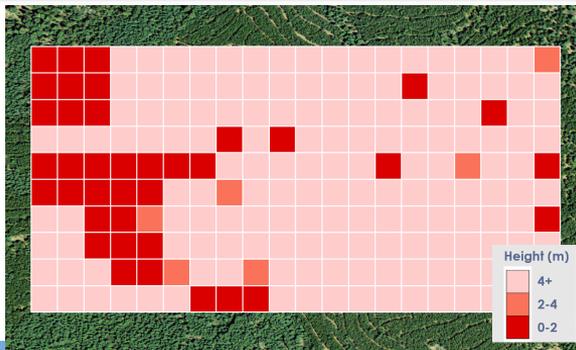
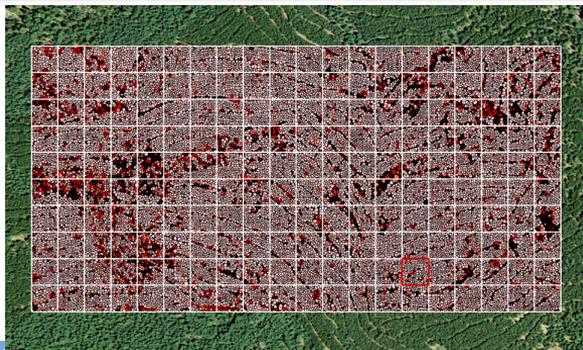
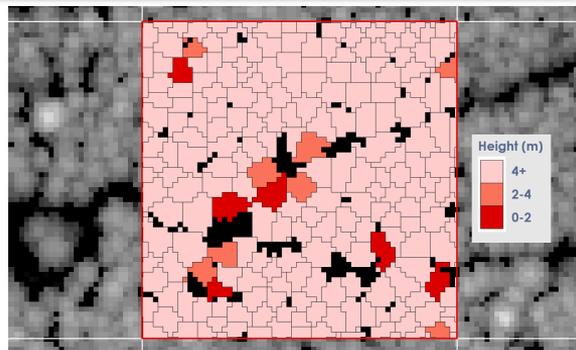
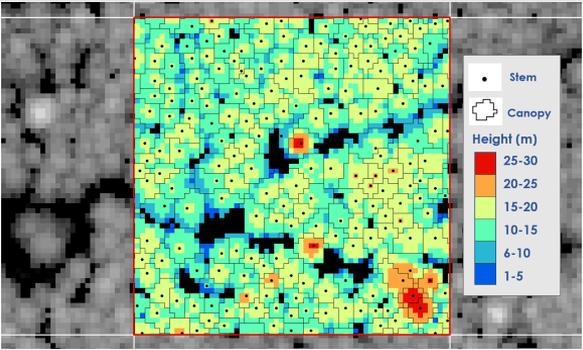
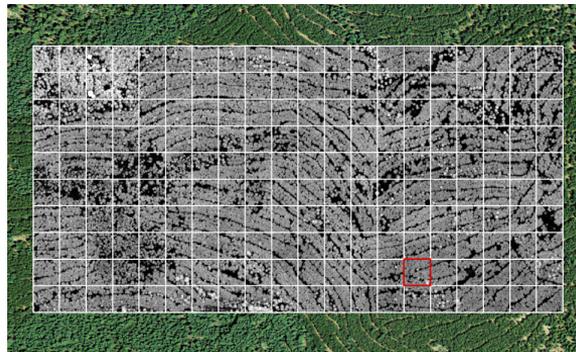
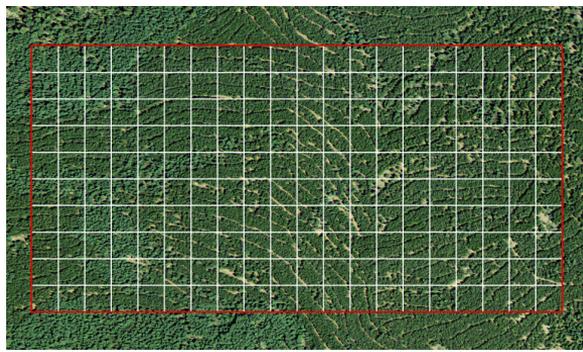


# Extract Ladder Fuel



# LiDAR Analysis

- Edge effects on surface fire spread at forest-grassland interface.
- High canopy understories increase risks of canopy fires due to continuous surface fuels created from ladders.
- Fuel treatments at these interfaces can reduce risks to entire forest patches





# SAVETREE



Google Earth Engine Search places and datasets...

## SAVeTrEE

Defaults to calculate NDMI ending in 2016 at a 5 year interval

- Select spectral index
- Select end year and duration of time series  
From 1984-2016 Recommend 3-5 years
- Create time series  
  
 Coefficient Trend  
Decline Stable Growth  
 Bivariate map  
Peak green Max health  
0 Peak moisture
- Export trend and bivariate maps  
To initiate export, click "Export to Drive" below, drag down code, click "Tasks", and "Run"

### Change Inspector

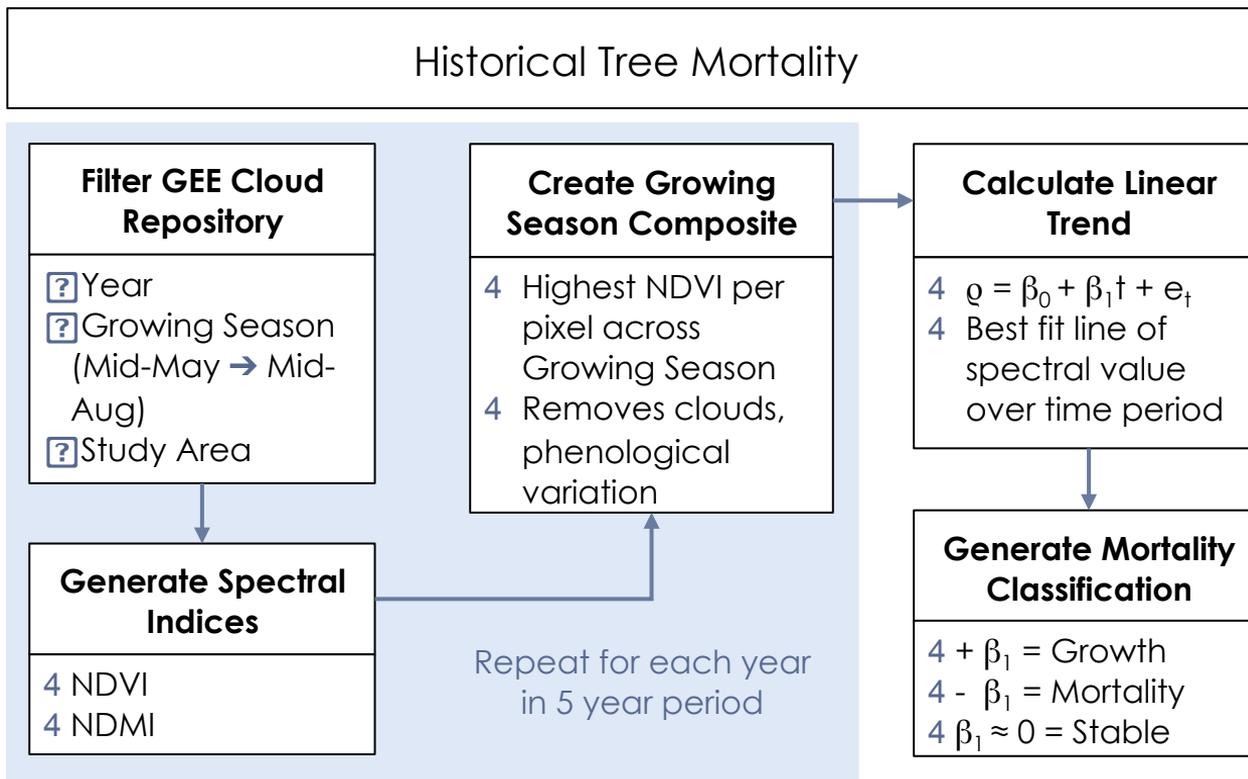
Click a point on the map to inspect.  
lon: -121.39 lat: 40.52

NDMI Over Duration

Date	NDMI
2011	110
2012	110
2013	-250
2014	-250
2015	-250
2016	-250

Map data ©2017 Google 2 km

# Methodology





# SAVETREE DEMO



# Up And Coming

## Goddard

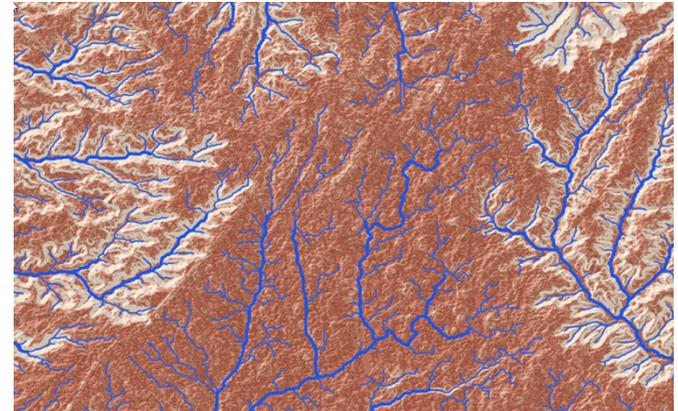
An Interactive Model of Mosquito  
Presence and Distribution to Assist  
Vector-Borne Disease  
Management in Western Europe



9 New  
projects to  
GitHub

## Idaho

Monitoring and Forecasting  
Precipitation Patterns and Erosion  
Potential to Enhance  
Archaeological Preservation and  
Decision Making

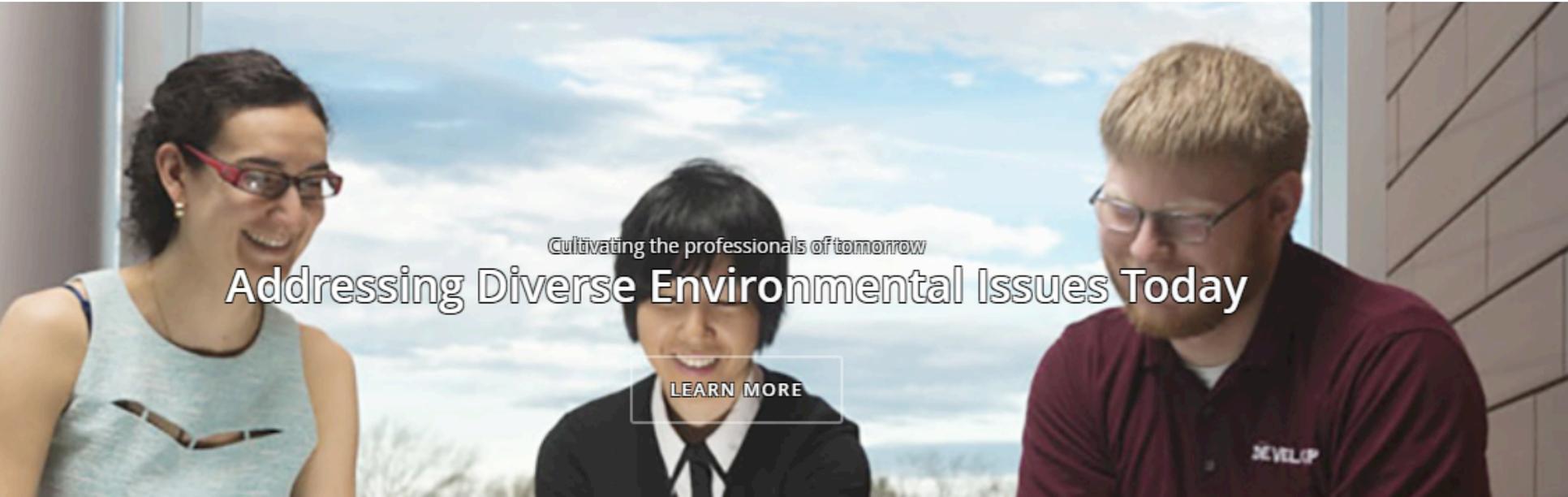




# Questions?

[develop.geoinformatics@gmail.com](mailto:develop.geoinformatics@gmail.com)

<https://develop.larc.nasa.gov/>



*Cultivating the professionals of tomorrow*

**Addressing Diverse Environmental Issues Today**

LEARN MORE